

KEYNOTE LECTURES

ID ABS WEB: 138334

4. Soil health in achieving the Sustainable Development Goals 4.24 133598 - Anthropogenic drivers of soil biodiversity, its function and feedback to changes

SOIL FAUNA AND ECOSYSTEM SERVICES PROVISION: THE FAUNASERVICES AND SOILFAUNA PROJECTS

<u>G. BROWN</u>¹, J. MATHIEU ², M. COOPER ³, W. DEMETRIO ³, E. THEBAULT ², A. POTAPOV ⁴, Z. LINDO ⁵, B. PEY ⁶, G.S. MACROFAUNA CONSORTIUM ⁷, N. EISENHAUER ⁷

¹ Embrapa Forestry, Curitiba, BRAZIL

- ² Universite Sorbonne, Paris, FRANCE
- ³ ESALQ-USP, Piracicaba, BRAZIL
- ⁴ Senckenberg Museum, Goerlitz, GERMANY
- ⁵ University of Western Ontario, London, CANADA
- ⁶ Universite de Toulouse, Toulouse, FRANCE
- ⁷ iDiv/University of Leipzig, Leipzig, GERMANY

Soil animals represent up to 27% of all known species worldwide, and many taxa are frequently used as bioindicators of disturbance, land use management and soil health. This is because they contribute to the provision of important ecosystem services to human beings, in all categories: cultural, provisioning, supporting and regulating. Services provided include soil formation, habitat for organisms, decomposition and nutrient cycling, climate regulation, pollination, seed dispersal, biological control of pests and pathogens, preservation of cultural heritage, recreation, food, fiber and fuel production, source of pharmaceuticals and genetic resources, water availability and quality, and erosion control. In this way they also help achieve the United Nations Sustainable Development Goals (SDGs). However up to now, few attempts have been made to assess and value their multiple services provided in different land uses worldwide.

Both the FaunaServices and the sOilFauna projects, involving a large number of collaborators worldwide aim to assess various services provided by the soil macrofauna communities sampled using standard methods (handsorting following TSBF/ISO) in both natural and anthropogenic ecosystems. This is being achieved by using data on the abundance (density and biomass) of up to 12 main taxa of soil macrofauna, among a wider list of almost 45 taxa collected in over 8500 sites worldwide (sOilFauna) and 1500+ sites in the Amazon and Atlantic Forest biomes (FaunaServices). Foodweb models and knowledge on biological and stoichiometric relationships of the taxa are being used to assess C, N and P cycling, pest control, decomposition, and bioturbation rates. By calculating these functions and using current market values, avoided and replacement costs, the value of a range of services will be estimated in contrasting land uses to assess opportunity costs and benefits associated with management and conservation of soul fauna communities. These actions intend to support policy development, awareness raising, and the achievement of goals associated with the CBD's International Initiative for the Conservation and Sustainable Use of Soil Biodiversity.

Keywords: soil fauna, soil health, bioindicators, land use, ecosystem services